

Introduction to the Alaska EMS system

Air medical escorts and the physicians who make medical transportation decisions in Alaska should be familiar with the Alaska EMS system. An understanding of its organization and the scope of practice for each level of medical provider is important to ensure that patients get appropriate care, both in medical facilities and during transports.

Learning Objectives

Upon completion of this chapter, the participant should be able to:

- ▶ List three important events in the history of air medical transport.
- ▶ Describe Alaska's air medical transportation system.
- ▶ List eight types of credentials in the EMS system in Alaska.
- ▶ Describe the five levels of communities in Alaska.
- ▶ Explain the difference between rescue and medevac.
- ▶ List six options for air transport in Alaska's EMS system.

History of Air Medical Transport

The Beginning

The Wright brothers flew their “powered glider” at Kitty Hawk in 1903. Soon after that, health care providers began to think about using this new machine to transport patients. The first 20 years of flight saw rapid improvement in the size, speed and reliability of aircraft. These improvements made the idea of air medical evacuation, or medevac, a possibility.

There is no proven case of aircraft being used for air medevac before the 20th century. However, for many years it has been taught that the first recorded air medevac was in 1870. In that year a hot air balloon was reportedly used to move patients out of Paris during the Franco-Prussian war. In 2003 in *Air & Surface Patient Transport, Principles and Practice* that claim was refuted. The concept of air medevac, however, did exist in fiction long before the 20th century. In 1866 Jules Verne coined the term “air ambulance” in his book, *Robur le Conquerant* (or *A trip Round the World in a Flying Machine*). This book described the rescue of shipwrecked sailors by a balloon named the *Albatross*.

The French used aircraft in 1912 to move soldiers who were wounded on the battlefield. The United States started using medevac aircraft around 1918. By World War II, air medevacs were well accepted and 1.4 million soldiers were evacuated by air during that war. Only 46 people died en route.

The Military’s Role

The military led the way in using aircraft for transporting patients. During the 1930s special airplanes were designed to move patients between several of the large military hospitals. These airplanes had two engines, heated cabins, litters for six to ten patients, and short runway capability.

In 1942 Sikorsky made the first helicopter with “side car” litters. They were used in Burma in 1944 to medevac injured soldiers. By the late 1950s helicopters had moved almost 20,000 casualties. During the 11

years of the Vietnam War, over 200,000 soldiers were evacuated by air. Some of them were transported in larger helicopters that held up to nine patients.

In reviewing the military medevac statistics, one fact stands out: The quicker people are moved from the scene of the trauma to a place of definitive care, the better their chance of survival. Military data show that mortality dropped from 4.5 deaths per 100 casualties during World War II to 2.5 deaths per 100 casualties in the Korean War. The chart below shows the relationship between transport time and survival rates from World War I through the War in Vietnam.

Civilian Services

After the experiences of the Korean War, efforts were made to use air medical transportation for civilians. Some of the early efforts included use of military helicopters in Belgium in 1963 and in Philadelphia in 1965. The Philadelphia project was called Helicopter Emergency Lifesaving Patrol or H.E.L.P. The H.E.L.P. project was unique because it joined doctors and medical personnel from Lankenau Hospital with the Atlantic Refining Company's "Go Patrol" traffic helicopter. It served the Delaware Valley area. The next use of helicopters in transporting patients was in late 1967. Superior Ambulance Service in Westland, Michigan started a commercial helicopter ambulance service using the Bell Ranger 47-J.

The first dedicated non-military medevac systems were sponsored by:

- Maryland State Police, helicopter, under the medical direction of R. Adams Cowley, MD in 1969/1970.
- Samaritan Air Evac, Phoenix, AZ, the first hospital-based fixed wing program in 1969.
- St. Anthony's Hospital in Denver, CO, a hospital-based helicopter program in 1972.
- Loma Linda Hospital in Loma Linda, CA a hospital-based helicopter program in 1972.

Military Survival Rates

| | Evacuation Time (hrs) | Mortality Rate (%) |
|---------|-----------------------|--------------------|
| WWI | 18 | 18.0 |
| WWII | 4-6 | 4.5 |
| Korea | 2-4 | 2.5 |
| Vietnam | 1-2 | 1.8 |

Source: Ed Holmes's Soundings: Aeromedical History Page <http://members.cox.net/eholmes333/>

Aviation History in Alaska

Before modern transportation reached Alaska, many people had little or no access to medical care. Dog teams and boats were the most common ways to move patients to hospitals or clinics from remote villages or other remote sites.

July 1920

In July 1920, General William Mitchell and seven companions flew four DeHavilland planes from New York to Nome. This showed that long-distance air travel was possible. Mitchell's flight marked the beginning of a new era for transportation in Alaska.

1924–1929

By 1924, two pioneer bush pilots were serving remote Alaskans. In the Ketchikan area, Roy Franklin Jones started a commercial air service in 1922. Two years later Ben Eielson was flying mail and supplies out of Fairbanks to several Interior villages. Both pilots are believed to have carried medical passengers. In 1929, Eielson and his mechanic, Earl Borlund, died while trying to reach the ice-locked ship *Nanuk* off Cape North, Siberia. This was one of Alaska's early search and rescue flights.

1946

By 1946, more than 35 commercial air carriers operated in the territory. They carried nearly 100,000 passengers and 5 million pounds of freight annually. Northwest Airlines flew daily between Seattle and Anchorage. Pan American Airways served routes from Seattle to Ketchikan and Fairbanks daily, Juneau six days a week and Nome weekly.

Perhaps more than any other group of people, Alaskans had come to view air travel as routine.

1950s

Many airports were built after World War II. Alaska hurried to join the explosion in air travel. Jet service between Alaska and Seattle started in the late 1950s. This brought more improvements in ground facilities for aircraft, and removed any doubts about the importance of air travel in the state's emerging modern lifestyle.

Emergency Medical Service System

1960s

In the early 1960s, medical and aviation technologies had advanced far beyond the days of Kitty Hawk. However, the quality of care for medevac patients had not improved much over the past few decades. Air medicine was relatively unexplored. Patient transport was basic at the time, with little or no medical care given during flight. Ground ambulance services in the state were largely undeveloped. People who traveled with injured and seriously ill patients had no special training. Government and medical providers were just beginning to think this was important.

1966–1973

The modern era of prehospital care in the United States began in 1966, when a document known as the “White Paper” (*Accidental Death and Disability: The Neglected Disease of Modern Society*) was published by the National Academy of Sciences, National Research Council (NAS-NRC). This paper described urgent problems in prehospital care and it pushed Congress to take action. In 1966 Congress passed the Highway Safety Act, and in 1973 it passed the Emergency Medical Services Systems (EMSS) Act. Both Acts were aimed at reducing highway fatalities and improving the quality of emergency medical services throughout the nation.

1969

“EMS consciousness” began in 1969 in Alaska. That year the first Highway Safety Act funds purchased new ground ambulances. Further funding was used to establish an Emergency Medical Technician (EMT) training program. Widespread EMT training would, over time, provide medically-trained providers for medevacs in Alaska. The Department of Public Safety headed the Emergency Medical Services (EMS) program at this time, and provided EMT training at its Public Safety Academy in Sitka.

Late 1960s

In the late 1960s, two other developments helped the growth of prehospital and medevac activities in Alaska:

- Medicaid designated transportation as one of eight approved categories of service that it would reimburse. Under Medicaid, about 40,000 more people became eligible for medical and transportation services. This helped the General Relief Medical Program to serve more people.

- The Indian Health Service established the Community Health Aide system in Alaska which began to provide basic medical care in virtually every Alaska Native village.

1972–1981

EMS grew rapidly under the Department of Public Safety. In 1972, Public Safety supported development of the newly created state Office of Emergency Medical Services, in the Department of Health and Social Services. The Office of Emergency Medical Services was funded jointly by federal National Highway Traffic Safety Administration (NHTSA) funds and a Robert Wood Johnson grant. The Office selected a board to advise the EMS Director. They worked with Public Safety to select sites for new ambulances, which had been purchased with federal funds. The Alaska State Troopers continued to operate the EMT training program at their Sitka academy.

After Congress passed the EMSS Act, federal funds earmarked for EMS were received in Alaska in 1974. It required the state to write a detailed EMS plan and subdivide itself into regions. The regions had to reflect a number of factors, including patient flow. The Alaska Legislature supplemented federal funds with state money for the first time in 1978. It provided full funding for the statewide EMS system when federal grants ended in 1981.

1981–present

EMT training has continued to move forward. The first state EMS regulations took effect in 1981. The number of state-certified EMTs was 1,600 by 1983. In 2003, there were 3,343 certified EMTs (I, II, and IIIs) and 266 licensed Mobile Intensive Care Paramedics (MICP) in Alaska.

The Role of the Military in Alaska EMS

From the end of World War II through the mid 1970s, the military played a crucial role in medevac operations in Alaska. Today that role has changed. The primary emphasis is on search and rescue (SAR) operations rather than transporting medical patients.

The Military Aid to Safety and Traffic (MAST) Unit, the 68th Medical Company, out of Fort Wainwright, Alaska, is an exception to this. The MAST Unit uses Sikorsky Blackhawk helicopters to provide medevac service to Fairbanks and the Interior Region of Alaska. They started this service in 1979, with the 283rd Medical Company using UH-1 (Huey) helicopters.

A number of other government agencies also transport medical patients and participate in rescue activities.

The U.S. Coast Guard

The U.S. Coast Guard began SAR operations in Alaska a few years after the purchase of Alaska from Russia in 1867. The USCG Cutter *Bear* arrived in Alaska waters in 1884. It was active in Alaska for 40 years. The Coast Guard continues to have rescue vessels in eight Alaska ports and has two Air Stations (in Kodiak and Sitka) equipped with Sikorsky HH60J Jayhawk helicopters. Crews consist of two pilots, a flight mechanic, and a rescue swimmer during search and rescue missions. During medevacs, a health services technician (usually an Alaska EMT-II) or a flight surgeon is added to the crew.¹

The U.S. Air Force

The U.S. Air Force (USAF) became active in SAR during World War II. It continued the service until 1991, when these duties were shifted to the Alaska Air National Guard. The 71st Aerospace Rescue and Recovery Squadron (ARRS) at Elmendorf Air Force Base was the last USAF active duty unit to provide SAR service to Alaska.

The Alaska Army National Guard

The Army Guard's 1297th Medical Detachment (air ambulance) started in 1986. Its mission was to provide battlefield combat search and rescue (CSAR) upon mobilization. In peacetime, the detachment augmented existing military medevac units in Alaska. It transitioned to Detachment 1, 1085th Medical Company (helicopter ambulance) in 1989, and was the last UH-IV medevac unit to fly the Huey airframe. It was transferred to the Kansas Army National Guard in 1993.

The Alaska Air National Guard

The Air National Guard is a state military asset. The Air Guard's 210th Air Rescue Squadron (ARS) started in January 1991. Its mission is to fly both military and civilian SAR flights as well as transporting air medical patients. Today, the Alaska Air National Guard has the 210th Air Rescue Squadron (RQS), which uses six HH-60 Pavehawk helicopters (Blackhawk airframe with in-flight refueling capabilities giving them a virtually unlimited range); the 211th ARS, which has six HC-130s (fixed wing aircraft that refuel the HH-60s in-flight); and the 212th ARS, which includes the Pararescuemen, who are special operations medical personnel.

¹ J. R. Bowman, "The Coast Guard Medevac Mission in Southeast Alaska," *Air Medical Journal*, Vol. 22, No. 4, 2003, pp. 20–23.

Alaska Civilian Medevac System

In 1980, the North Slope Borough created a search and rescue system. It uses both helicopters and fixed-wing aircraft. The North Slope Borough Fire Department/Search and Rescue Medevac Service is busy as it performs both search and rescue and medevac duties with full-time career medical and aviation staff.

The State Troopers put two new helicopters into service in 1980. One is in Anchorage and the other is on the North Slope Haul Road (now known as the Dalton Highway). SAR and medical missions are just a few of the duties for the State Trooper helicopters.

The number of civilian air services offering medevac care has grown since the early 1970s.

- In 1972, ERA Helicopter Corporation became the first modern private air medical service in Alaska. It primarily performed air medical transports from the North Slope.
- In 1978, ERA acquired Jet Alaska, which had been performing long distance fixed-wing medical transports.
- In 1981 Alaska Medevac Systems began a helicopter and fixed-wing medevac service.
- In 1982 Airlift Northwest, a Seattle-based group serving Southeast Alaska, started service.
- In 2004 there are nine certified medevac services, eleven certified critical care air ambulance services and one certified specialty care service. Some agencies are credentialed at more than one certificate level.

Flying remains a key way to travel in Alaska. In 2002 there were over 10,000 registered pilots in Alaska. That means that about one out of every 62 Alaskans is a pilot. There are over 10,000 registered aircrafts as well. Alaska has about six times as many pilots per capita and 14 times as many aircraft per capita as the rest of the United States.

While the exact number of medevacs flown in Alaska is not available, the best estimation is 4,000 air medical flights per year.

The EMS System in Alaska

The EMS System in Alaska is made up of the following responders. A person with any of the following credentials may be called upon to transport a patient by aircraft.

Community Health Aide/Practitioner (CHA/P)

In 2003, there were 425 Community Health Aide/Practitioners (CHA/P) serving 200 villages. These villages may be far from the nearest hospital to which it refers patients. The CHA/Ps provide primary health care in their villages. It maintains regular clinic hours and provides emergency care 24 hours a day. Specialized CHA/P training is 16 weeks. In addition to their CHA/P training, CHA/Ps receive at least the Emergency Trauma Technician (ETT) training. Many are EMTs.

Emergency Trauma Technician (ETT)

ETTs receive at least 40 hours of training in the basics of emergency medical care. This course was developed by Southeast Region EMS Council, Inc. and exceeds the content found in the 1995 revision of the National Standard First Responder curriculum. ETTs are registered by the regional EMS offices.

Emergency Medical Technician-I (EMT-I)

EMT-I is based on the National Standard EMT-Basic curriculum. In addition to the national EMT-B material, there are Alaska-specific learning objectives. EMT-I training is at least 120 hours in length. The EMT-I provides basic life support such as splinting, bleeding control, oxygen therapy, suction and CPR. EMT-I, EMT-II and EMT-IIIs are certified by the Department of Health and Social Services, EMS Unit.

Emergency Medical Technician-II (EMT-II)

The EMT-II is trained to start IVs and perform advanced airway techniques. They can initiate intravenous, intraosseous lines, administer crystalloid fluids and administer a few medications. The training to become an EMT-II is at least 50 hours in length, after becoming an EMT-I. The EMT-II level requires sponsorship by a department-approved physician medical director.

Emergency Medical Technician-III (EMT-III)

The EMT-III has more training in treating cardiac patients than the EMT II. They can interpret ECGs, perform manual defibrillation, and can use morphine, lidocaine, atropine and epinephrine. The training for



Beaver Creek Community Health Aide Clinic.
Beaver Creek, Alaska. Level I Community.



Yukon Flats Health Center
Fort Yukon, Alaska. Level II Community.



Yukon-Kuskokwim Delta Regional Hospital.
Bethel, Alaska. Level III Community.

EMT III is an additional 50 hours of training after certification as an EMT-II. The EMT-III level also requires sponsorship by a department-approved physician medical director.

The Department of Community and Economic Development, Division of Occupational Licensing licenses all the following medical providers. The State Medical Board licenses paramedics, physician assistants and physicians, while nurses are licensed by the Alaska Board of Nursing.

Mobile Intensive Care Paramedic (MICP)

MICPs are the most highly trained prehospital emergency care providers. The National Standard Paramedic curriculum averages 1000–1200 hours. Alaska requires a 480-hour internship for new paramedics. MICPs function under the direct or indirect supervision (standing orders, etc.) of a physician. The MICP scope of practice is defined in 12 AAC 40.370.

Registered Nurse (RN)

Training varies from diploma programs to four-year college degree programs. Advanced nursing degrees are also available. After completing a training program, nurses must pass a national licensing exam. The nursing scope of practice is defined in Alaska Statute 08.68.

Nurse Practitioners (NP)

NPs are midlevel providers. They are registered nurses with advanced training.

Physician Assistant (PA or PA-C)

PAs are midlevel providers. The scope of practice of physician assistants is defined in Alaska Statute 08.64.380. PA training programs range from a certificate program to Master's degree programs. PAs in Alaska are required to be certified by the National Commission on Certification of Physician Assistants, Inc. (NCCPA).

Physician (MD or DO)

Physicians have completed medical school. They can provide medical direction to EMTs, MICPs, nurses, and mid-level providers. Each certified air medical service must have a physician medical director.



Bartlett Regional Hospital.
Juneau, Alaska. Level IV Community.



Alaska Native Medical Center.
Anchorage, Alaska. Level V Community.

Levels Of Communities In Alaska

Alaska's health care facilities range from small village health aide clinics to large referral hospitals in Anchorage. The Alaska EMS Goals Document defines five levels of communities in Alaska. These levels of communities, and the health care facilities within them, should not be confused with trauma center designation levels.

Level I

Level I communities typically have Community Health Aide/Practitioner (CHA/P) clinics. There are over 175 CHA/P clinics throughout the state. They are operated by CHA/Ps. They hold regular clinic hours and provide the primary health care needs of their community. CHA/P clinics are only found in Native communities.

Level II

Level II communities have sub-regional hub clinics. These health centers usually are staffed with Nurse Practitioner (NPs) and/or Physician's Assistants (PAs). Occasionally these clinics will have a physician on staff. There are over 50 Level II community clinics throughout the state. Some examples of Level II communities include McGrath, Fort Yukon, Unalakleet, Skagway, Glennallen and Aniak.

Level III–V

Level III, IV and V communities have hospitals. There are 24 hospitals in Alaska, including two military facilities.

- **Level III communities** have community hospitals with limited services and several beds. Level III communities include Barrow, Bethel, Nome, Kotzebue and Dillingham.
- **Level IV communities** have regional hospitals. They provide additional services, including surgical capability and CT scanners. Level IV communities include Fairbanks, Juneau, Soldotna and Palmer.
- **Level V communities** have large, tertiary care centers. Anchorage is the only Level V community in Alaska. These centers provide referral service for the entire state and have specialties not available in the rest of the state.

Rescue vs. Air Medical

Rescue is defined in the dictionary as “freeing from confinement, danger...” (Webster’s 7th New Collegiate Dictionary). A specialized team with rescue equipment may rescue and move the patient to a location where a medevac crew can assess and transport the patient. Rescues can evolve into medevacs when the person is sick or injured. Many rescue teams are also capable of performing medevac missions (e.g. U.S. Coast Guard).

A mission becomes an air medical mission when the patient requires medical care and transportation by air to a clinic or hospital.

In Alaska, the line between a rescue mission and an air medical mission has blurred over the years. Some rescue teams have EMTs and paramedics capable of performing the medevac mission. However, the primary mission of rescue teams is removing people from dangerous situations while treating the medical condition is a secondary concern. Some air medical teams respond directly to scenes in remote areas. They may be the first responders or they may be meeting local ground EMS providers. Their primary mission is providing medical stabilization and transportation to a medical facility. Medical crews generally do not have the capability to rescue a patient if specialized equipment is necessary.

Mission Types

The following examples should clarify rescue vs. air medical missions:

Example 1–Rescue:

A man falls from a cliff. A military helicopter is dispatched to retrieve him. A corpsman (military medic), stabilizes the man. The patient and the corpsman are flown to a hospital.

Example 2–Rescue:

A Search and Rescue (SAR) team finds an overdue hunter. EMTs with the SAR team provide treatment for hypothermia. A helicopter is called to transport the patient from the scene to a medical facility.

Example 3–Air Medical:

A person is injured in a 4-wheeler crash. The local EMS crew takes him to the clinic. A local air taxi transports the patient to a hospital for treatment.

Example 4–Air Medical:

A man falls from a roof and sustains multiple internal injuries. The local EMS squad takes the patient directly to the airport for a flight to the trauma center in Anchorage, bypassing the village clinic.

Example 5–Air Medical:

Local fire and rescue crews work to extricate and package the patients involved in a motor vehicle crash (MVC). An air medical service is called to the scene to transport the patients to the hospital.

Air Transport Options In Alaska

In Alaska not all patients are transported by state certified air medical services. Sometimes the first available aircraft is used. This depends on the situation and the patient's needs. Options for transporting medical patients by air in Alaska include:

- Air taxis.
- Commercially scheduled flights.
- Alaska State Troopers.
- 68th Medical Company MAST.
- 210th Alaska Air National Guard.
- US Coast Guard.
- Local Army Guard.
- State certified Air Medical Services.

Summary

Air medical transport of patients has a long history in Alaska. Due to the geography of Alaska, vast distances to medical care, and limited roads, air transport of patients is a necessity as well as a luxury. The air medical system in Alaska continues to expand and improve patient outcomes. This is through the addition of air medical services and training opportunities for air medical providers.

The remainder of the book will provide information on making the decision to transport a patient by air, a discussion on aircraft used in air medical transports, the gas laws that affect air travel, the stresses of flight and its implications for specific conditions, surviving an aircraft crash and cultural considerations in Alaska.